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Amendments to the Claims:

A complete listing of the claims, including Claims 1-6, 10, 11, 14, 15, 17-23, 26, 103 and 106 as currently canceled and new Claims 123-142 as added, is set forth below:

1-122. (Canceled).

123. (New) A method of identifying an acetyltransferase substrate in a sample, the method comprising the steps of:

(a) contacting the sample with

(i) a reagent comprising a thiol-containing compound, a halo-acetyl-CoA or a halo-acetyl-pantetheine, and

(ii) an acetyltransferase,

under conditions suitable for acetyltransferase enzyme activity, and

(b) identifying a substrate that has formed a base-stable covalent bond to the reagent, wherein the reagent is labeled with a label and/or the acetyltransferase is labeled with an affinity tag, and the substrate is the acetyltransferase substrate.

124. (New) The method of claim 123, wherein the reagent is the halo-acetyl-CoA labeled with a label.

125. (New) The method of claim 123, wherein the reagent is the halo-acetyl-pantetheine labeled with a label.

126. (New) The method of claim 123, wherein the reagent is the thiol-containing compound labeled with a label.

127. (New) The method of claim 123, wherein the reagent comprises the halo-acetyl-CoA and the thiol-containing compound, wherein either the halo-acetyl-CoA or the thiol-containing compound is labeled with a label.

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128. (New) The method of claim 123, wherein the reagent comprises the halo-pantetheine CoA and the thiol-containing compound, wherein either the halo-acetyl-CoA or the thiol-containing compound is labeled with a label.

129. (New) The method of claim 124, wherein the halo-acetyl-CoA is a chloroacetyl-CoA.

130. (New) The method of claim 124, wherein the halo-acetyl-CoA is a bromoacetyl-CoA.

131. (New) The method of claim 124, wherein the halo-acetyl-CoA is a fluoroacetyl-CoA or an iodoacetyl-CoA.

132. (New) The method of claim 126, wherein the thiol-containing compound is aminoethanethiol.

133. (New) The method of claim 126, wherein the thiol-containing compound is labeled with a fluorophore.

134. (New) The method of claim 132, wherein the aminoethanethiol is labeled with a fluorophore.

135. (New) The method of claim 123, wherein the label is radioactive.

136. (New) The method of claim 135, wherein the radioactive label is ^{32}P .

137. (New) The method of claim 123, wherein the label is fluorescent.

138. (New) The method of claim 123, wherein the label is an affinity label.

139. (New) The method of claim 138, wherein the affinity label is biotin.

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140. (New) The method of claim 123, wherein the acetyltransferase is labeled with an affinity tag.

141. (New) The method of claim 140, wherein the affinity tag is an oligo-His tag.

142. (New) The method of claim 123, wherein the acetyltransferase is selected from the group consisting of a histone acetyltransferase, an N-terminal acetyltransferase, an arylamine N-acetyltransferase, an aminoglycoside acetyltransferase, chloramphenicol acetyltransferase, choline acetyltransferase, carnitine acetyltransferase, spermine acetyltransferase, and ornithine acetyltransferase.